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ABSTRACT

A model is presented to provide guidance for Coast Guard writers, curriculum developers, course coordinators, and instructors who intend to update, or draft course materials. Detailed instructions are provided for developing instructor's guides and student's guides. (CS)

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A MODEL FRAMEWORK FOR SCIENCE AND OTHER COURSE MATERIALS CONSTRUCTION

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TABLE OF CONTENTS

	Page
I. Overview	1
A. System Construction	1
B. System Integration	2
1. Horizontal	2
2. Vertical	2
II. Guides	2
A. Introduction	2
B. Types	3
1. Instructor's	3
a. Introduction	3
b. Sections	3
(1) Title Page	3
(2) Table of Contents	5
(3) Forward	5
(4) Course Scope	5
(5) General Reference	5
(6) Class Schedule	6
(7) Course Time Allocations	6
(8) Course Behavioral Objectives	6
(9) Course Pretest	7

(10) Course Post Test 7

(11) Instructor Evaluation of the student 7

(12) Student Evaluation of the Course and Instructor 8

(13) Assignment of Class Standing 8

(14) Record of Student Competencies 8

(15) List of Qualifications for Advancement Covered 9

(16) List of Required Student References 9

(17) List of Required Forms 9

(18) List of Required Equipment 9

(19) List of Student Handouts 9

(20) List of Student Assignments 9

(21) How to use the Instructor's Guide 9

(22) Lesson Plans; Instructor Background and Student Handouts 10

2. Student's 10

a. Introduction 10

b. Sections 11

(1) Title Page 11

(2) Table of Contents 11

(3) Forward 11

(4) Course Scope 11

(5) Class Schedule 11

(6) Course Behavioral Objectives 11

(7) Instructor Evaluation of the Student 11

(8) Student Evaluation of the Course and Instructor 11

(9) Assignment of Class standing 12

(10) List of Qualifications Covered 12

(11) List of Required Student References 12

(12) How to Use the Student Guide 12

(13) Lesson Assignments and Handouts 12

III. Writing Instructions 12

A. Format 12

B. Type Spacing 13

C. Lettering and Numbering 13

References 14

Index 15

I. OVERVIEW

The model presented in the following pages was developed to provide guidance for those who must upgrade, update, otherwise modify or draft course materials in the original. It is intended to be used by Coast Guard course writers, curriculum developers, course coordinators and instructors as a decision support system. The framework provides an overview of materials, essential course areas and instructor and student oriented topics cogent to class-to-class and day-to-day course conduct. Course materials developed to fit this framework provide a coherent and logical system easily followed by instructors even though they may not have taught a specific course for some time. Such construction cuts substantially the time instructors must invest in course mechanics prior to teaching a course.

The model is intended to be used as an extension of the Instructional Systems Development (ISD) model, translating that model into materials useable by classroom teachers and students (Chief, Naval Education and Training, 1975, 1978). Although it is intended for use in a service school environment the model has been field tested extensively, with excellent results, in post secondary educational environs. When field tested, section (15), List of Qualifications for Advancement Covered was omitted because it lacked relevance.

A. System Construction. The system, whether we discuss introductory or advanced courses, consists of companion volumes, an instructor's guide and a student's guide. Each is put together before a course begins and each is bound whenever possible.

B. System Integration. The system is integrated two ways - horizontally and vertically.

1. Horizontal Integration. There are two guides for each course regardless of whether the course is at the beginning or the advanced level. Much of the material included in the Instructor's Guide is also included without alteration in the Student's Guide.

2. Vertical Integration. Vertical integration exists only in cases where there are introductory and advanced courses dealing with the same subject. In this case students who enroll in the advanced course are assumed to be competent (at the minimum level expected of students successfully completing the basic course) in subjects covered in the basic course. While some time at the advanced level may be devoted to reviewing basic subjects this course is not intended to be a regurgatation of basic material presented at a later date. The subjects of review then are related directly to those presented earlier.

II. GUIDES

A. Introduction. As mentioned above, there are two types of guides for each course. An Instructor's Guide and a Student's Guide. If the materials are to be used as intended and a course taught in the same manner, both types of guides must be used whenever a course is offered.

B. Types.

1. Instructor's.

a. Introduction. An Instructor's Guide is a series of lesson guides that collectively outline the testing, teaching and learning activities to be accomplished in a course of instruction. The document serves as the instructor's primary teaching aid.

All information related to the activities required for student achievement at a particular level of instruction are outlined in the guide. This includes such things as utilization of teaching aids, instructional materials, required equipment, teaching techniques and methods and exercises that will collectively enhance the learning process.

b. Sections.

(1) Title Page. The title page is the first page of the guide. It includes four types of information; (1) the name of the guide, for example, "Instructor's Guide for the Instructor Training Course"; the author, editor or compiler's name; (2) the name of the author's institution; (3) the institution's address and; (4) the date the guide was prepared. An example of such a page follows.

(a) Example.

INSTRUCTOR'S GUIDE FOR THE

INSTRUCTOR TRAINING

COURSE

BY

Alexander Hamilton

Training Division

United States Coast Guard Reserve Training Center

Yorktown, Virginia 23690

January 1981

(2) Table of Contents. The Table of Contents follows the title page. It lists by page, all of the major subject matter divisions within the guide.

(3) Forward. The forward contains an overview of the course. It includes such information as course length, and type of learning system. For example, if the course is of contemporary vintage and intended for use within the Coast Guard Service Schools System, it probably is a mastery learning or competency based type of course. In short, any information which helps to provide instructors with a well rounded picture of the course is included here.

(4) Course Scope. This section identifies the subject areas covered during conduct of the course. These areas are often the same as those listed in the Course Time Allocations section of the guide.

(5) General References. General references are all of the references from whence course materials, background information and the like were drawn. They are listed in this section first by subsections. One subsection includes Coast Guard numbered publications, directives and instructions. The other includes text books which are listed alphabetically by the author's last name. An example of a text listing is found in the References Section at the end of this document. An outline of this section is shown below.

(a) Example.

General References

I. Coast Guard Publications

A. Numbered Documents (eg. CG-000)

B. Commandants Instructions

II. Text Books

(6) Class Schedule. The class schedule breaks the entire course down by days of the week and then hours. It identifies what subject area will be covered by instructor and students during each hour of each day of a course.

(7) Course Time Allocations. Each subject covered in the course is listed in this section as are the times in minutes devoted to each subject.

(a) Example.

SUBJECT	TIME(minutes)
Dictation and Transcription	400

Although 400 minutes of the total course are devoted to the subject of dictation and transcription the time may be spread over several days. This section, therefore, is somewhat different from the class schedule section.

(8) Course Behavioral Objectives. This is a list of behaviors students should be able to demonstrate as a result of having taken the course. They identify terminal behaviors. They are the first items to be drafted during course construction. The objectives should be listed in this section by lesson number and ther by the sequential order in which they are covered in a lesson.

(9) Course Pretest. The course pretest is an instrument administered at the beginning of the course to determine the entering behaviors of students, that is, how competent students are with the subjects covered in the course. Pretests then are necessarily designed around the course behavioral objectives. Pretest results are used not only as a diagnostic devise, but as a method of determining if, when and how instruction within a course should be altered. If students demonstrate a high level of facility with certain subjects, then the instructional level in those areas should be high. The converse is of course true when students demonstrate little or no competence in an area.

(10) Course Post Test. The course post test is an instrument administered at the end of the course. It is much like the pretest in the sense that it is designed to determine students' mastery of the course objectives. It measures situations similar to those measured in the pretest. The results are also often compared with pretest results to ascertain the amount of learning gain that has taken place within a student or the entire class. The results are not used as a method of evaluating student achievement for the purpose of course grading.

(11) Instructor Evaluation of the Student. This section includes information describing the methods by which student success is evaluated, i.e. how student competency with the objectives is actually determined. In competency based mastery learning types of courses, competency is very often determined by success in completing individual lesson related activities. Levels reflecting a demonstration of minimum competency with the objectives are reflected by the criteria set forth for each objective. These criteria are included in the lesson plans.

(12) Student Evaluation of the Course and Instructor. Students are given the opportunity to evaluate both the course and the instructor. The evaluation usually takes place at the end of the course. It usually occurs as part of the course critique. This section includes two items: (1) a sample of the course evaluation forms and; (2) other information both necessary and or useful in completing the evaluation.

(13) Assignment of Class Standing. If courses are competency based and activity based (competency is determined based upon success in completing activities at the criterion level), then it is possible to have many students who excel or perform at high levels of competence. Coast Guard administrators, however, require an assignment of class standing. This section outlines for both instructors and students how that assignment is to be made. One suggested method is to take the total number of course objectives (assuming they are all of equal importance), divide that number into 100 and then multiply the quotient by the number of objectives mastered by each student.

(14) Record of Student Competencies. The record is an accounting system. The simplest method is to use an XY coordinate graph. The students' names may be listed on one axis and the objectives on the other. If the graph is divided into blocks, once an objective is mastered, a "P" may be placed in the respective box. A failure to master an objective is indicated by an empty box. See the following example .

(a) Example

OBJECT. / NAME	#1	#2	#3	
JONES		P		
SMITH	P		P	

(15) List of Qualifications for Advancement Covered. This is a list of qualifications (if applicable to the course) covered during course conduct. They are taken from Commandant Instruction 1414.8, Enlisted Qualifications Manual and from CG-3303C, "Record of Practical Factors." This list is related to the course behavioral objectives.

(16) List of Required Student References. This is a list of all references which students must use during the course. The list is a compilation of all references listed in the student references sections of the various lesson plans. The list does not include student handouts. Finally, the section is set up in the same manner as the General References Section.

(17) List of Required Forms. Some courses require that students develop expertise completing certain types of forms, looking up information necessary to complete the forms and so on. Those forms are listed here by form number, title, and lesson.

(18) List of Required Equipment. This is a simple list of all equipment used during the course by both students and instructor.

(19) List of Student Handouts. Student handouts are listed in this section by lesson and then handout number within lessons (eg. 14-1, 14-2, 14-3).

(20) List of Student Assignments. Student assignments are listed here by lesson.

(21) How to Use the Instructor's Guide. This section contains a detailed description of how the guide is to be used.

(22) Lesson Plans; Instructor Background and; Student Handouts. The guide includes all lesson plans to be used with the course. A section entitled, "Instructor Background" is included with each lesson plan. This section is included to provide instructors with an overview of the lesson material, a review of subject presented in the lesson or both. In most cases it is a quick refresher, not intended to provide indepth coverage of a subject. Instructors must return to the literature for indepth treatments. Student handouts used as part of a lesson are included with the lesson plan (as are lesson assignment sheets and instructor correction guides). They are intended to be used as a quick ready reference by instructors. Student handouts and assignments are also included in the course Student's Guide.

2. Student's.

a. Introduction. The Student's Guide includes a series of instruction sheets which collectively provide students with supplementary materials (in addition to manuals and text books) needed for successful completion of a particular course. Prepared in conjunction with the course Instructor's Guide the Student's Guide includes instruction sheets which list reading and other assignments such as homework, problem analysis exercises, diagram sheets and other special units of additional or amplifying information. The Student's Guide is assembled in one binder. All of the material in the Student's Guide is also in the Instructor's Guide, but all of the information in the Instructor's Guide is not in the Student's Guide.

b. Sections.

(1) Title Page. This page is set up in the same format as the title page of the Instructor's Guide. The only difference between this page and the same page of the Instructor's Guide is the title.

(2) Table of Contents. The Table of Contents follows the title page. It lists, by page number, all of the major divisions within the guide.

(3) Forward. This section is identical to the Forward section in the Instructor's Guide.

(4) Course Scope. This section is identical to the course scope section in the Instructor's Guide. It provides students with an idea of subject sequences and time spent on each subject.

(5) Class Schedule. The schedule is the same as the one included in the Instructor's Guide.

(6) Course Behavior Objectives. These are the same objectives as are listed in the Instructor's Guide. They inform students of the areas in which they are expected to show competence upon completion of the course.

(7) Instructor Evaluation of the Student. The information here is the same as that in the companion section of the Instructor's Guide. It identifies, for students, exactly how their performance in a course will be evaluated.

(8) Student Evaluation of the Course and Instructor. This section is the same as its companion in the Instructor's Guide.

(9) Assignment of Class Standing. Information in this section is intended to describe the method by which students' class standings will be determined.

(10) List of Qualifications Covered. The information in this section outlines those items from Commandant Instruction M1414.8 (old CG-311), Enlisted Qualifications Manual and CG-3303C "Record of Practical Factors" which are covered by the course.

(11) List of Required Student References. This is a list of all references students must use in order to complete the course as intended by the curriculum developer.

(12) How to Use the Student Guide. This is a detailed set of instructions indicating exactly how students are to use the guide, how it is integrated with the Instructor's Guide and so on.

(13) Lesson Assignments and Handouts. This section includes, by lesson number, all of the assignments and student handouts relevant to course content.

III. WRITING INSTRUCTIONS

A. Format. The format for both Instructor's and Student Guides are the same as that shown in the Table of Contents of this document, beginning in each case with the title page. Sections are sequenced as shown there. Each section begins with the title in capital letters and generally speaking, each section begins on a new page.

B. Type Spacing. Type should, wherever possible, be single spaced in the Student Guide. Except the lesson plans and Record of Student Competencies, the Instructor's Guide should be double spaced. With regard to lesson plans, verbage written sections should be single spaced while two spaces are left between sections. See the example provided below.

1. Example.

INTRODUCTION. _____

Single spaced verbage Included here.

Double space and then start next section.

PROCEDURE: _____

C. Lettering and Numbering. Pages are numbered sequentially from 1 beginning with the Forward. The Table of Contents is numbered with small Roman numerals. Page numbers are placed in the upper right corner of each page.

Lettering and numbering within sections should follow the outline format shown below:

I.

A.

1.

a.

(1)

(a)

i

Individual sections of the two guides need not be numbered.

REFERENCES

Chief, Naval Education and Training Interservice Procedures for Instructional Systems Development (NAVEDTRA 106A). Naval Air Station, Pensacola, Florida, Chief of Naval Education and Training, 1975.

Chief, Naval Educational and Training Instructional Systems Development (NAVEDTRA 110). Naval Air Station, Pensacola, Florida: Chief of Naval Education and Training, 1978.

INDEX

Advancement 1, 9

Assignments 9, 10, 12

Class standing 8, 12

Competency 5, 7, 8

Course scope 5, 11

Evaluation 7, 8, 11

Example 3-6, 8, 13

Handouts 9, 11, 12

Handouts 9, 10, 12

Instructor's Guide 1-4, 10-13

Integration 2

ISD 1

Objectives 6-9, 11

Practical factors 9, 12

Qualifications 1, 9, 12

Reference 11

Student's guide 1, 2, 10

Student's guide 1, 2, 10

Time allocations 5, 6

Title page 3, 5, 11, 12